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(54) GAS FIRE

(71) We, UNITED GAS INDUSTRIES LIMITED, af 3—4 Bentinck Street, London, W1M 6DH, a British company, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to gas fires, particularly to gas fires incorporating means simulating solid fuel burning fires.

The invention provides a gas fire comprising a radiant forming a fire-bed extending upwardly and rearwardly toward the back of the fire and supporting a non-combustible simulation of solid fuel, a gas burner located adjacent a frontmost edge of said fire-bed and adapted to direct flame upwardly and rearwardly so as to heat said fire-bed, and a heat-resistant glass panel extending across the front of the fire.

Preferably said burner comprises a manifold extending across the first and having a series of apertures forming gas jets.

One specific embodiment of a fire not according to the invention is shown in the drawing accompanying the Provisional Specification which is a side section through the fire.

Embodiments of the invention are shown in the accompanying drawings, in which:—

Figure 2 is a side section through part of a second fire, and

Figure 3 is a side section through a third fire.

The first shown in the drawing accompanying the Provisional Specification comprises two burners—a front burner 11 and a rear burner 12. Front burner 11 comprises an elongated, multiple aperture burner extending substantially the width of the fire and directing flame substantially vertically. The flames from burner 11 extend into a combustion chamber 13 also extending the width of the fire. At the rear side of chamber 13 is a radiant surface having radiant bars 14 positioned to be heated by the flames to a glowing heat and therefore to radiate heat forwardly of the fire. At the front side of the chamber 13 are formed a series of horizontal fire bars 15. These are formed of ceramic material as are also radiant bars 14, but are coloured black and shape to simulate the metal fire bars in an open grate. The rear surfaces of the fire bars 15 are also exposed to the flames from burner 11 and become heated thereby to add to the radiant heat.

Extending at a shallow angle upwardly from the rear of chamber 13 is mounted the rear burner 12 which is of the plaque type, of trapezium shape and extends the width of the interior of the fire. As shown, the burner comprises a plate 17 of refractory material having its upper surface covered in dimple radiants 18 and narrow gas ways 19 extending therethrough. Above plate 17 is a layer of irregularly shaped pieces 20 of blackened, non-combustible ceramic material made to simulate the appearance of coke. Simulations of coal or logs however can be used. Flames from the rear burner 12 heat the dimples 18 and play on the simulated coke, heating it to a red glowing condition indistinguishable in appearance from burning coke. Radiant heat is also emitted from the hot "coke" to add to the heating effect of the front burner.

The sides and rear of the fire are lined with firebricks. A rear opening 22 above the "coke" communicate with a heat exchanger 23 and therethrough with an exhaust flue The heat exchanger 23 is situated in a convection air passage 25 through which air is drawn from the lower front of the fire to be heated by the heat exchanger and passed out at the upper front 26 of the fire.

A door 28 of high temperature glass closes the front of the fire.

Beneath the front hearth of the fire a gas supply pipe leads to a dual gas cock 30. The gas cock provides two valves, one controlling outlet pipe 31 leading to a manifold supplying the front burner 11 and the other controlling outlet pipe 32 leading to a manifold supplying the rear burner 12. The two valves are arranged so that the rear burner 12 is supplied with a set supply of gas at all open positions of the gas cock, but the front

burner 11 can be adjusted. The said set supply may for instance be 7000 BThU per hour, while the maximum supply to the front burner may be 13000 BThU per hour.

In use the first simulates very closely indeed a coke burning fire. The front vertical radiant bars 14 give a homogeneous glow through the simulated fire bars 15, while the glowing bed of "coke" above glows brightly from the "coke" itself and from the burner plate 17 below. The two therefore combine to give the appearance of the front and top of a body of coke burning in a fire contained by the bars 15. The majority of the radiated heat originates from the very efficient front burner and radiant arrangements, while the less efficient "coke" radiates extra heat. The efficiency is also improved by the glass front which not only avoids the need for a fire guard but also allows the combustion air supply to be better controlled. The convected air also contributes to the efficiency of the fire.

It will therefore be seen that although the heated "coke" arrangement is not an inherently efficient method of radiating heat, it has proved possible to take advantage of its very convincing fire simulation in a fire having an overall efficiency greater than that of the heated "coke" arrangement.

Figure 2 shows a fire which is a modification of that described above. It has the components 11, 13, 14, 15 and 28. The rear burner 35 is however different from burner 12 in that it is not a plaque type. Burner 35 comprises a manifold 36 extending across the fire and having a series of apertures 37 forming gas jets directed upwardly and rearwardly. A ceramic radiant surface 38 forms the bed of the fire and ceramic block radiants 39 spaced from surface 38 define therewith a combustion chamber 40. A ceramic simulation of logs 41 above the block radiants 39 produces when heated the appearance of burning logs. The glow of the radiants 38, 39 is seen in the gaps between the "logs".

A more efficient heat exchanger 42 is provided having three chambers each having air passages on both sides, i.e. a treble pass heat exchange. However a single pass heat exchanger as shown in Figure 1 could be used.

In the simplified variation of fire shown in Figure 3, a single firebrick base 60 extends rearwardly and upwardly and provides openings 61, 62 forming the burner chambers for a series of front burners 63 and a series of rear burners 64 respectively. Simulated logs 65 rest on the base 60. A double pass heat exchanger 66 leads the combustion products to a flue 67 while heated convected air is passed into the space to be heated through apertures 68. A high temperature glass door 69 extends across the front of the fire tilted back at a small angle. In this embodiment the firebrick base 60 also acts as a radiant which when heated radiates heat through the glass door into the space to be heated.

WHAT WE CLAIM IS:—

1. A gas fire comprising a radiant forming a fire-bed extending upwardly and rearwardly toward the back of the fire and supporting a non-combustible simulation of solid fuel, a gas burner located adjacent a frontmost edge of said fire-bed and adapted to direct flame upwardly and rearwardly so as to heat said fire-bed, and a heat-resistant glass panel extending across the front of the fire.

2. A gas fire as claimed in claim 1, wherein said burner comprises a manifold extending across the fire and having a series of apertures forming gas jets.

3. A gas fire as claimed in claim 2, wherein there are further radiants, which are block radiants spaced from said fire-bed.

4. A gas fire as claimed in any of claims 1 to 3, wherein there are more radiants disposed at the front of the fire and another burner adapted to direct flame substantially vertically over said more radiants.

5. A gas fire as claimed in claim 4, wherein some of said more radiants simulate fire bars.

6. A gas fire as claimed in any of claims 1 to 5, wherein a heat exchanger is located to heat convected air by means of exhaust gases from said gas burner.

7. A gas fire as claimed in claim 7, wherein said heat exchanger is of the single pass, double pass or treble pass type.

8. A gas fire substantially as described hereinbefore with reference to the accompanying drawings.

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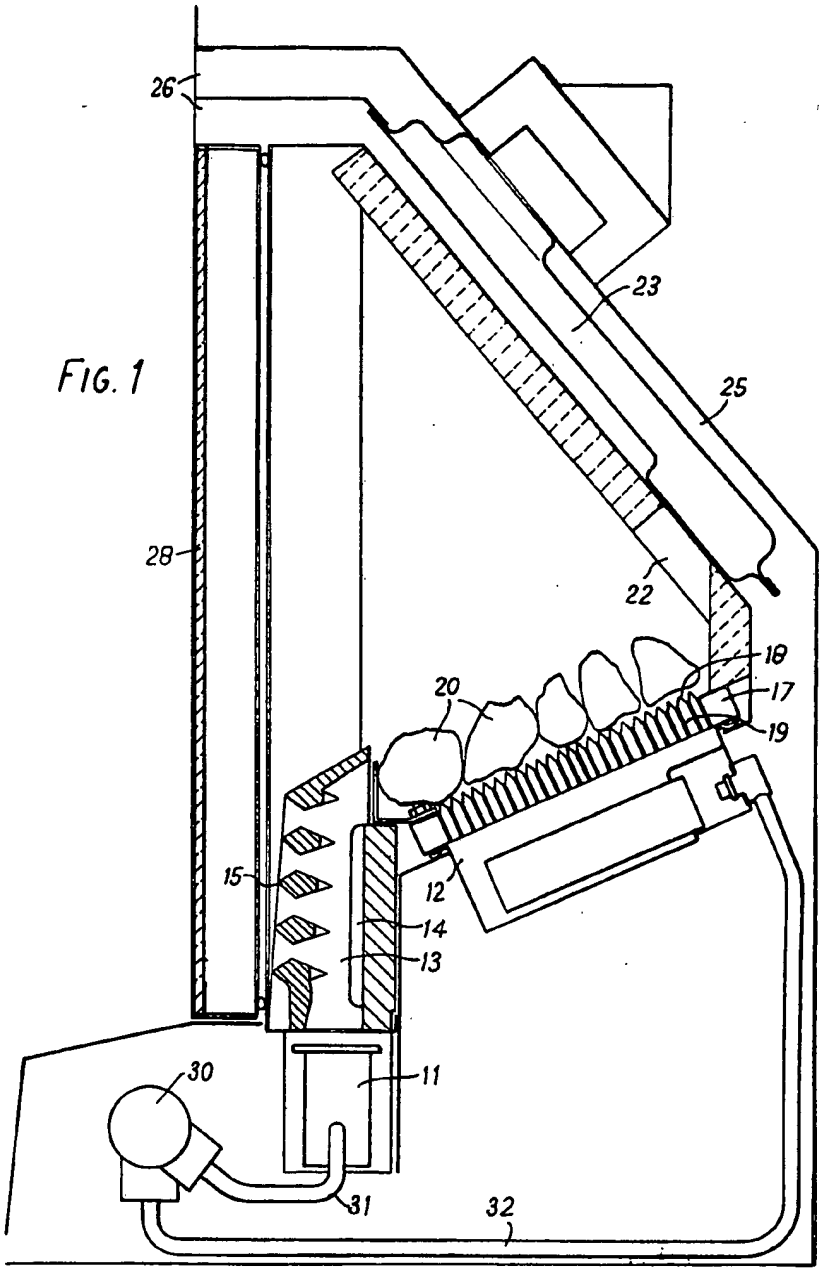
FIG. 1



1488479 COMPLETE SPECIFICATION
2 SHEETS *This drawing is a reproduction of the Original on a reduced scale*
Sheet 1

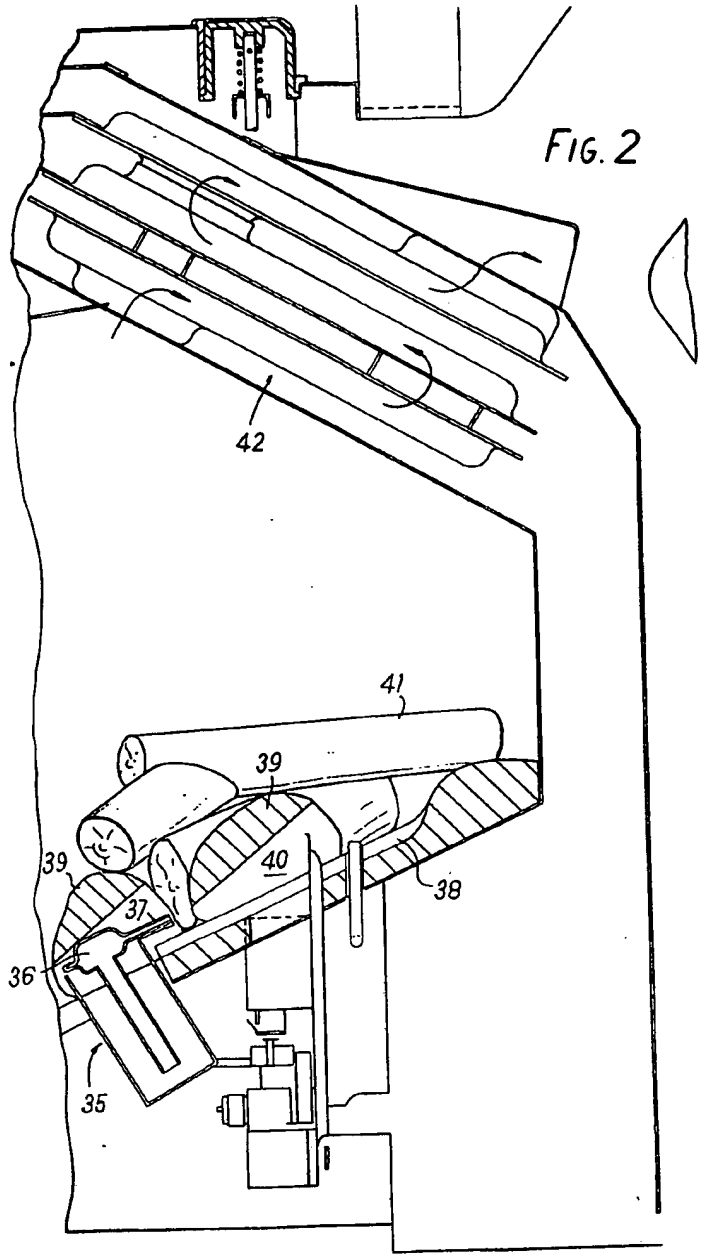


FIG. 2

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1488479 COMPLETE SPECIFICATION
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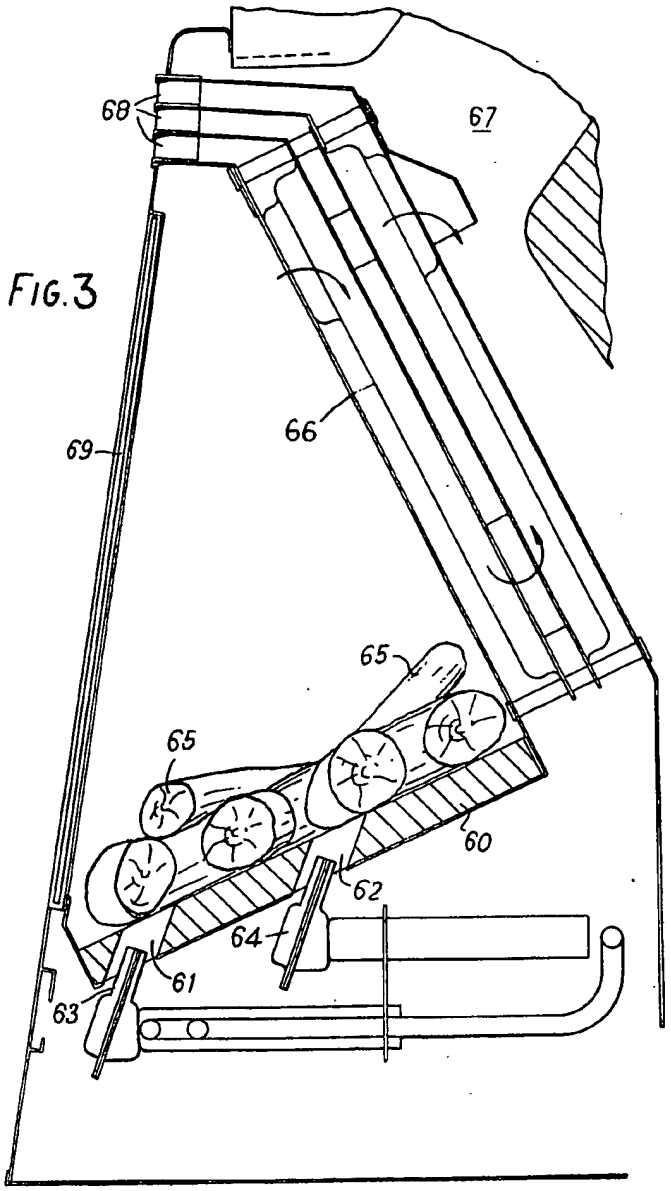
Sheet 2

FIG.3



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DERWENT-ACC-NO: 1977-J3955Y
DERWENT-WEEK: 197741
\~4~COPYRIGHT 1999 DERWENT INFORMATION LTD\~14~
TITLE: Gas fire with simulated solid fuel - has inclined radiant element with burner bar located adjacent forward edge
INVENTOR-NAME:
PRIORITY-DATA: 1973GB-0041932 (September 6, 1973)
PATENT-FAMILY:

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INT-CL_(IPC): F24C003/04
ABSTRACTED-PUB-NO: GB 1488479A
BASIC-ABSTRACT: The gas fire has a radiant element forming a fire bed extending upwardly and rearwardly towards the back of the fire to support a non combustible solid fuel simulation. A gas burner is located adjacent a front most edge of the fire bed and directs flame upwardly and rearwardly to heat the fire bed. A heat resistant glass panel extends across the front of the fire.

The gas burner pref. comprises a manifold extending across the fire and having a series of apertures forming gas jets. Shock radiant elements are pref. spaced from the fire bed.

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